Report to the Congress on Communication Services not subject to federal excise tax

REPORT TO THE CONGRESS ON

COMMUNICATION SERVICES

NOT SUBJECT TO

FEDERAL EXCISE TAX

Office of Tax Analysis
U.S. Department of the Treasury

August 1987

THE SECRETARY OF THE TREASURY
WASHINGTON

August 21, 1987

Dear Lloyd:

Section 8061 of Public Law 99-509, The Omnibus Budget Reconciliation Act of 1986, provides that the Secretary of the Treasury, in consultation with the Secretary of Commerce and the Chairman of the Federal Communications Commission, "shall conduct a study of communication services which are exempt from the tax imposed by section 4251 of the Internal Revenue Code of 1954 by reason of being a private communication service (as defined in section 4252(d) of such Code) or by reason of a specific exemption from such tax under section 4253 of such Code." The study is to include an estimate of the reduction in tax revenues by reason of each exemption, a description of who benefits from each exemption, and a method under which the tax could be extended to private communication services.

Pursuant to that section, I hereby submit the "Report to the Congress on Communication Services Not Subject to Federal Excise Tax."

I am sending a similar letter to Congressman Dan Rostenkowski, Chairman of the Committee on Ways and Means.

Sincerely,

James A. Baker, III

The Honorable Lloyd Bentsen
Chairman
Committee on Finance
United States Senate
Washington, D.C. 20510

Enclosure

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1. INTRODUCTION AND SUMMARY

I. BACKGROUND OF THE STUDY

The Federal communications excise tax is currently imposed at a rate of three percent on local and toll (long-distance) telephone service and on teletypewriter exchange service, with certain specified exemptions. The tax is scheduled to expire at the end of 1987. First enacted in 1914 as a tax of one cent on toll telephone calls and telegraph messages costing over 15 cents, both the base and the rate of the communications excise tax have been subject to frequent revision. The base of the tax was expanded to leased wires in 1918, to cable in 1932, and to local telephone and wire and equipment services in 1941. In 1965, the base of the tax was narrowed to its current definition. The rate of tax has been changed even more frequently, varying from a high of 25 percent (for long-distance services) in 1943, to as low as one percent (for all services) in 1982. In part, these changes in the base and the rate of tax have reflected the rapid changes in the availability of communications services, as well as in the technology for providing those services. These changes also reflect the underlying rationale for the tax, which is simply that it has proven to be an expedient source of revenue. A further reflection of this rationale is that the tax has been repealed twice (in 1916 and from 1924 to 1932), and has been continuously scheduled to again expire since 1959.

The specific mandate for this Report in P.L. 99-509, The Omnibus Budget Reconciliation Act of 1986, is to study the various exemptions to the communications excise tax, and to describe a method under which the tax could be extended to private communication services. The exemption for private communication services was added in 1965, in order to equalize the tax treatment of internal communications systems (such as a private branch exchange, PBX, system) purchased by businesses, and similar services leased to businesses by telephone companies. Leased systems had been subject to tax if they could access a local telephone exchange, whereas purchased systems were not taxed. Equalization of treatment was achieved by exempting leased systems from tax. While this exemption technically applies only to local telephone service, available technologies, as well as the statutory definition of toll telephone service lead to exemption for a number of essentially long-distance services

provided by telephone companies. Further, equipment purchased by businesses for long-distance internal communications (such as microwave relay systems) are free of tax, just as local systems are. All of these factors should be taken into account in any consideration of the extension of the tax to private communication services.

In addition to the exemption for private communications systems, there are a number of specific exemptions to the communications excise tax. These specific exemptions are for certain coin-operated service; installation charges; items otherwise taxed; and for some or all services used by common carriers and communications companies, news services, international organizations, state and local governments, nonprofit hospitals and educational organizations, and servicemen in a combat zone. The Federal government is exempt by virtue of a separate provision. The newest of these exemptions, for nonprofit hospitals, was added in 1966 and many of the exemptions were included in the early statutes. These specific exemptions have apparently not been subject to a careful review and analysis for many years.

II. PRINCIPAL FINDINGS

The major findings of the study are:

1. The communications excise tax should be allowed to expire at the end of 1987 as scheduled under current law and as envisioned in the President's FY 1988 Budget. The tax causes economic distortions and inequities among households. Further, allowing the tax to expire would obviate the need to address the issues raised by the various exemptions to the tax. There is no policy rationale for retaining the communications excise tax in the federal tax system.

2. The current exemption for private communication service eliminates the differential tax treatment of leased and purchased equipment as well as the tax-caused differential between private communication and noncommunication purchases generally, but creates differential tax treatment of private and nonprivate communication service. If the communications excise tax is not allowed to expire, alternatives to this exemption should be considered.

3. Three alternatives to the current law exemption for private communication service are examined:

    - A return to previous law, under which leased systems were taxed, is not a desirable alternative because it would reinstate the differential between leased and purchased equipment.

- Taxing both leased and purchased equipment would address the differential between private and nonprivate communication services created by the current exemption while improving neutrality between leased and purchased equipment. However, there are a number of problems with this alternative, including difficulties in defining communications equipment, and avoiding differentials between various types of equipment.

- Current law could be improved somewhat by redefining "private communication service."

4. If the communications excise tax is extended, consideration should be given to modifying or repealing some of the specific exemptions.

III. Organization of the Report

The organization of the report is as follows. Chapter 2 gives an overview of certain aspects of the telecommunications industry by discussing recent developments in the structure of the telecommunications industry and the market for business telecommunication service. Chapter 3 covers the history of the communications excise tax, describes the base and rate, exemptions, and administrative provisions of the current tax, lists the general criteria for judging an excise tax, and then evaluates the communications excise tax against these criteria. Chapter 4 examines the exemption for private communication service. The differential treatment of leased and purchased communications equipment that led to the current law exemption is discussed first, and it is pointed out that this exemption solves one problem but creates another. Three alternatives to current law are then described and analyzed: a return to prior law; taxation of both leased and purchased communications equipment; and improvement of current law. The specific exemptions to the communications excise tax are examined in Chapter 5.

2. THE TELECOMMUNICATIONS INDUSTRY

I. RECENT DEVELOPMENTS IN THE TELECOMMUNICATIONS INDUSTRY

That the telecommunications industry has undergone far-reaching changes in recent years should come as no surprise to anyone familiar with the landmark divestiture settlement of the antitrust suit brought by the United States against American Telephone and Telegraph (AT&T). However, the status of the telecommunications industry also changed dramatically in the three decades prior to the 1982-83 settlement.

The telephone industry has always been offered as a classic example of a natural monopoly -- an industry in which average cost falls throughout the relevant production range. A single firm naturally comes to dominate such an industry: it can underprice its competitors because its costs continually fall as output is increased. As the single seller of the product, the firm can set its price at a high level. This is deemed to be inappropriate, especially in an industry that sells a good that is considered necessary for modern life, such as the telephone industry. One social policy that attempts to rectify this situation is one in which the industry is regulated by the government to prevent the firm from charging consumers high prices and earning extra-normal profits. The Communications Act of 1934 undertook such a social policy by placing the telephone industry under the authority of the Federal Communications Commission (FCC).

The door to competition in the telecommunications industry began to open with the FCC's 1959 Above 890 decision that allowed firms to construct their own private microwave communications systems. A microwave is "a communications system which relays both voice and data signals through space by using dish-shaped antennas placed on towers or building rooftops."[1] In the 1972 FCC Domestic Satellite decision, the 1959 decision was extended to domestic satellite systems.

Between 1969 and 1976, a number of firms were allowed to construct competing long distance facilities and to purchase basic long distance service from AT&T and resell it to the private line market. In 1969, the FCC's Specialized Common Carrier decision allowed private line voice and data carriers to offer services over their own facilities. The FCC's 1976 Resale and Share Use decision eliminated AT&T's tariffs prohibiting resale and shared use of their private-line services and facilities.[2]

In 1969, the Carterphone decision began competition in terminal equipment

manufacture and sales. The important point made in the Carterphone decision was that AT&T could not prohibit the use of devices that connected into the telephone system, although it could establish standards to be met by connecting devices.[3]

The most recent and well known change in the telephone industry is the 1982-83 settlement of the 1974 suit brought by the United States against AT&T, Western Electric, and Bell Telephone Laboratories, which went into effect on January 1, 1984 as the Modification of Final Judgement (MFJ). The MFJ allowed AT&T to retain ownership of Long Lines (long-distance), Western Electric (telephone manufacture and sale), and Bell Labs (research), but forced AT&T to divest its local telephone operating companies.

Seven regional holding companies (RHCs), comprised of the old Bell operating companies (BOCs), replaced AT&T in the local market. The Bell territory was split into over 160 Local Access and Transport Areas (LATAs), and each BOC provides intra-LATA exchange and exchange access services. The BOCs are not allowed to provide inter-LATA service even though they serve more than one LATA. Further, the BOCs are permitted to sell but not manufacture telephone equipment.

Two problems that the FCC must deal with are of interest in this report: bypass and the pricing of local service. "Bypass" means the "transmission of telecommunication messages that do not use the facilities or services of the local telephone company which are available to the general public, but that could use such facilities."[4] The long distance carriers can effectively be bypassed as well by the use of satellite equipment. Although bypass of the local exchange is becoming more common, basic local services continue to be regulated as if they were a natural monopoly.

The break-up of AT&T created a problem in the pricing of local services because local service rates have traditionally been subsidized by long distance revenues.[5] The subsidy has involved the allocation of a portion of local fixed costs to long distance and a portion of the revenue of long distance to local service. Since long distance and local service are no longer provided by the same company and since long distance rates are no longer regulated (except AT&T's rates to some extent), long distance revenue can no longer be allocated to local service. Consequently, a charge for access to local exchanges is allowed.

II. THE MARKET FOR BUSINESS TELECOMMUNICATIONS SERVICE[6]

Since the exemptions to the communications excise tax relate primarily to businesses, this section discusses some of the more important telecommunications options available to a business. The market for business telecommunications service is large, growing, and largely competitive. Currently, businesses spend about $70 billion on electronic communication, and their

expenditures are expected to rise to $150 billion by 1990. The telecommunication choices that are available to businesses have been changing rapidly. The new services that business customers can take advantage of can be classified by two broad categories, in-house networks and long-distance networks. Both types of networks are partial, if not total substitutes for local or toll telephone services, and therefore represent "bypass" technologies.

A. In-House Networks

In-house networks can be used to connect all types of electronic communication equipment between offices. These in-house networks are of three types: private branch exchanges (PBXs), Centrex, and local area networks (LANs). An example of a common PBX is a hotel switchboard. A hotel switchboard is used to connect incoming calls to the proper hotel room and allow access to the local telephone network from any hotel room, as well as connect calls between rooms within the hotel. Modern PBXs are much more sophisticated than a hotel switchboard, however. New models, such as the third generation digital PBXs, are in fact computers and perform both voice and data transmission simultaneously. Some new models even regulate the temperature of the hotel rooms. A Centrex is essentially the same as a PBX except that the switching of calls takes place off the customer's premises, typically at the local telephone company's switching stations.

LANs are similar to PBXs, but specialize in high-speed data transmission and typically are used only for data communication between computers. Some common LANs are Ethernet and Wangnet. LANs use their own cable which is usually installed next to the regular telephone cable.

B. Long-Distance Networks

Long-distance networks are generally of two types: those that interconnect with the existing telephone system and those that are independent from it. Interexchange common carriers sell an interconnected service by establishing their own phone system between cities and connecting with the local system in each city. Examples are AT&T, MCI, U.S. Sprint, and American Satellite. Value-added networks (VANs), such as Telenet, also interconnect with the existing telephone system. VANs use their equipment to offer services, such as making incompatible computers compatible, in addition to long-distance telephone communications.

A new type of business communication network, digital electronic message service (DEMS), is completely independent of the existing telephone system. Each DEMS customer has its own microwave "user station" for transmitting and receiving on top of its building.

3. THE COMMUNICATIONS EXCISE TAX

I. HISTORY

The communications excise tax was first enacted in 1914 as a tax of one cent on toll (long-distance) calls and telegraph messages costing over 15 cents. The tax was repealed in 1916, but reinstated in 1917 (at a rate of five cents). In 1918, a second-tier rate was added, as was a 10 percent tax on leased wire services (private-line telephone and similar communications services). The tax was again repealed in 1924, and again reinstated in 1932, but with a three-tier rate on toll telephone services, a five percent rate on telegraph messages and leased wire services, and an extension to cable at 10 cents per message. The rate on all of these services were increased in 1941, 1942, and 1943, when they were equalized at 25 percent. Also in 1941, the tax was extended to local telephone service and to wire and equipment service (such as stock quotation and other information services; burglar, fire alarm, and other protective services; recording and control services; and piped music and similar entertainment services when carried over wires). The rate on local telephone service was six percent (raised to 10 percent in 1942 and to 15 percent in 1943), and five percent on wire and equipment service (raised to eight percent in 1943). The high rates imposed in 1943 were reduced in 1954 to a general rate of 10 percent on all services except wire and equipment service, which was subject to an eight percent rate. The base of the tax was left essentially unchanged until 1965, when the base was narrowed to its current definition.

In 1959, the tax was scheduled to expire in 1960. This scheduled expiration was delayed a year each year from 1960 through 1964. In 1965, in connection with major excise tax reform that eliminated many federal excise taxes, the communications excise tax was scheduled to be phased out over the three years, with a three percent rate in 1966, two percent in 1967, one percent in 1968, and the tax repealed thereafter. In 1966, this phaseout was delayed one year, and in 1968 the beginning of the phaseout was delayed until 1970 during which the rate would be five percent, then three percent in 1971 and one percent in 1972, with expiration in 1973. This schedule was delayed a year in 1969, and in 1970 was replaced by a 10-year phaseout, which was to begin in 1973 and end with repeal of the tax in 1982. These reductions took place as scheduled through 1980, at which time the reduction to one percent

was delayed a year, until 1981. In 1981, the one percent rate was extended through 1984. In 1982, the rate was raised to three percent for 1983-85, and in 1984, the three percent rate was extended two years, through 1987. Table I gives the rate of tax, the tax base, and tax liabilities for 1970-1986.

II. DESCRIPTION OF THE TAX

The communications excise tax is imposed by section 4251 of the Internal Revenue Code of 1986. The tax rate of three percent is imposed on the amount paid for local telephone service, toll telephone service, and teletypewriter exchange service. The tax is imposed on the purchaser of the service, but is collected by the seller.[7] The tax is generally administered in the same manner as other excises.

Local telephone service is defined in section 4252(a) as access to a local telephone system and the privilege of telephonic quality communication with substantially all persons having telephone or radio telephone stations constituting a part of the local system. Also included is any facility or service provided in connection with local telephone service. Local telephone service explicitly excludes any service that is a toll telephone service, or a private communication service.

A toll telephone service is defined in section 4252(b) to be a telephone quality communication for which there is a toll charge that varies with the distance and elapsed transmission time of each communication and the charge for which is paid in the United States. Also included is a service which entitles the subscriber, through payment of a flat charge or a charge based on total elapsed transmission time (i.e., WATS service), to make an unlimited number of telephonic communications to or from all or a substantial portion of the persons having telephones or radio telephones in a specified area outside the local telephone system area in which the service is being provided.

A private communication service is defined in section 4252(d) as a communication service which entitles a subscriber to exclusive or priority use of any communications channel or group of channels, or to the use of an intercommunication system for the subscriber's stations, whether or not the channel, group of channels, or intercommunication system is connected through switching with a local telephone, toll telephone, or teletypewriter exchange service. Associated services, such as switching capacity and extension lines and stations, are included so long as they are necessary or unique to the use of channels or systems. Also included is channel mileage which connects a telephone station located outside a local telephone system area to a control office in the local telephone system. A separate charge must be made for any of these services for them to qualify as a private communication service.

TABLE 1

COMMUNICATIONS EXCISE TAX RATE, BASE AND LIABILITIES, 1970 - 1986

Calendar Year	Tax Rate	Tax Base ($ Millions)	Tax Liabilities* ($ Millions)
1970	10%	15,330	1,533
1971	10%	16,550	1,655
1972	10%	17,740	1,774
1973	9%	22,652	2,057
1974	8%	23,864	1,923
1975	7%	27,124	1,919
1976	6%	30,078	1,824
1977	5%	33,190	1,684
1978	4%	37,700	1,508
1979	3%	41,500	1,275
1980	2%	46,600	968
1981	2%	52,650	1,053
1982	1%	66,600	713
1983	3%	62,800	1,772
1984	3%	67,000	2,009
1985	3%	81,500	2,445
1986	3%	80,500	2,413

Department of the Treasury
Office of Tax Analysis

*Tax liabilities figures are based on returns processed. Therefore, differences in estimated tax base and reported liabilities between years may reflect processing delays, tax rate and base changes, and audit adjustments.

Because the communications excise tax is not imposed on private communication service, and by definition local telephone service excludes private communication service, any service that qualifies as a private communication service will be exempt from tax unless the service also qualifies as a toll telephone service.

Further, however, certain communication services are exempt from tax by virtue of being outside the definition of local telephone, toll telephone, or teletypewriter exchange service, even though they do not qualify as a private communication service. An example of such an exempt service was provided in Revenue Ruling 79-405, 1979-2 CB 383. In this example, a licensed interstate common carrier provided a microwave connection between a customer's stations in two locations, but to no other stations. Importantly, the microwave connection was not through a dedicated or priority channel, but rather through a group of channels available on a "first-come, first-served" basis. The charge for this service varied with the distance between a customer's stations, and the time of usage. This service was ruled to be neither a local telephone service (because there was no access to the local telephone exchange), nor a toll telephone service (because the distance for each customer was fixed, so charges could not vary for each customer by distance, and, again, there was no access to the local telephone exchange in the area called). Thus, this type of service is not subject to the communications excise tax.

In addition to these exemptions from the tax, section 4253 provides a number of specific exemptions. These specific exemptions are for certain coin-operated service; installation charges; items otherwise taxed; and for some or all services used by common carriers and communications companies, news services, international organizations, state and local governments, nonprofit hospitals and educational organizations, and servicemen in a combat zone. In addition, by virtue of section 4293 the United States and its possessions are exempt from tax.

III. ECONOMIC JUSTIFICATIONS FOR EXCISE TAXES

Although all taxes impose costs on society, a tax should be as efficient, equitable, and simple as possible. Excise taxes can be evaluated on the basis of these three criteria.

A. Efficiency

"Efficiency" refers to the economic concept that goods and services be used by firms in producing output in such a way that their output could not be expanded through a different mix of input goods and services costing less real resources, and that goods and services consumed by individuals be chosen so

that they could not be better off with a different choice costing less real resources.

Efficiency losses due to taxes are undesirable because, although the government gains revenue from the tax, the tax also causes resources to be misallocated so that the loss to firms and individuals is greater than the revenue gains by the government. In practice, all taxes including excises involve some efficiency loss through the misallocation of resources, except in special circumstances. Thus, excises may or may not be judged desirable on efficiency grounds, depending on the characteristics of the good being taxed.

In four special circumstances, excises will either minimize efficiency losses, or lead to efficiency gains. First, certain excises are less distortionary than other excises, or perhaps other taxes, and therefore would increase efficiency if substituted for these more distortionary taxes. Economic theory indicates that under certain conditions the distorting effects of taxes can be minimized by taxing price inelastic goods (those for which an increase in price leads to a small decrease in quantity demanded) rather than price elastic goods (those for which an increase in price leads to a large decrease in quantity demanded).[8] This just means that, to raise a given amount of revenue, those goods for which an increase in price leads to a smaller distortionary effect should be taxed more heavily.

A second efficiency reason to support an excise tax is to correct for a "negative externality." In this case, a properly designed excise will increase efficiency. An externality occurs when the activity of one firm or individual affects the welfare of another in a way that is not accounted for by the market. A classic example of a negative externality is the effect of pollution. Suppose firm A dumps harmful chemicals into a public river. But, suppose firm B is engaged in a fishing operation affected by the level of pollution. Firm A's activities are a cost to firm B, but firm A does not take account of this cost when it makes its production decisions. Consequently, firm A dumps more harmful chemicals into the river than is socially desirable. One solution to this problem is to place a tax on the dumping of harmful chemicals into rivers. This will force firm A to take account of the true social costs of disposing of harmful chemicals in rivers.

A third efficiency reason to support an excise tax is when the excise tax can be characterized as a "user fee." A user fee is a price paid by the users of a good or service provided by the government. For example, those who use roads pay a gasoline excise tax that is (or should be) designed to cover the cost of construction and repair of the roads. The efficiency gain in this case is relative to general fund financing, since a user fee will limit users to those willing to pay for the good or service provided by the government.

The term "merit goods" is sometimes used to describe commodities that ought to be provided even if people do not demand them. Similarly, "demerit goods" can be used to describe goods that society believes should be discouraged. Placing an excise tax on a demerit good would be a way of discouraging its

consumption. The term "sin" tax suggests that these taxes are sometimes justified as taxes on demerit goods.

B. Equity

There are two standards for tax equity or fairness. The first is referred to as horizontal equity, which is concerned with the fairness of a tax as it applies to taxpayers in similar economic circumstances. The second is referred to as vertical equity, which is concerned with the fairness of a tax as it applies to taxpayers in different economic circumstances.

Horizontal equity is generally considered to require that a tax apply equally to all taxpayers in similar economic circumstances. For households, economic circumstance is usually measured by current household income, with perhaps some allowance for household size or other relevant characteristics, such as wealth holdings. An alternative measure is current household consumption. Whatever the precise measure used, any tax that applies differentially to taxpayers in similar economic circumstances will violate the horizontal equity standard.

Excise taxes apply to particular goods and services purchased by households. The amount of these goods and services purchased by households in similar economic circumstances tends to vary quite widely. Under the usual assumption that excises fall on purchasers, therefore, excises violate the horizontal equity standard.

Vertical equity, applied to the combined tax and transfer systems, is often considered to require a more equal distribution of after-tax income. One way of achieving a more equal distribution of after-tax income is through the use of progressive taxes (those for which higher income people pay a higher proportion of their income in tax than lower income people). Excise taxes on luxury goods can be supported for such an equity reason. Unfortunately, luxuries are also usually goods that are price elastic so that an equitable excise tax is usually inefficient.

The types of excise taxes that are used in practice have generally been found to be regressive.[9] Regressivity may not be a strong argument against present excise taxes, however, for three reasons.

First, it is the progressivity of the combined tax and transfer systems rather than of a particular tax that is of concern. If a particular tax is regressive but accounts for only a small percent of tax payments, the effect on the after-tax distribution of income may be negligible.

Second, it should be noted that regressivity results are generally obtained from annual income and consumption data. But, a better measure of income may be lifetime income, and distributional results usually become less regressive when lifetime income is used.[10]

Third, the transfer system can be used to change the distribution of income. Transfer payments are often much better suited, and much more

important, to achieving distributional goals for lower-income families than is the tax system. Further, transfer payments are often indexed for price changes, so that the apparent regressivity of an excise tax may be largely, if not entirely, offset through increases in transfer payments.

C. Simplicity

Simple taxes are desirable because of lower administrative costs (both for the government and for taxpayers) and a higher rate of compliance. The taxpayer does not need to expend as much time or other resources to understand and pay a simple tax as compared to a complicated tax. This will reduce the taxpayer's costs, and may increase his willingness to pay the tax. The government also saves from a simple tax since less time and money needs to be spent processing forms and, presumably, it will be less difficult to determine whether a taxpayer has paid the proper amount.

Further, simplicity of the tax system as a whole is affected by the number of different taxes in the system. As long as other tax policy goals can be met, it would be desirable to eliminate taxes in order to simplify the tax system as a whole.

IV. AN ECONOMIC EVALUATION OF THE COMMUNICATIONS EXCISE TAX

A. Efficiency

The most compelling case for the communications tax is the commonly held belief that demand for telephone service as a consumption good is relatively unresponsive to price changes, and consequently the tax will result in a relatively small distortion. This argument, while having some validity, is not a completely accurate description of the demand for telephone service. Studies of residential telephone demand have distinguished between local and toll calls, the use of the local telephone system (number of calls) and access to the local system, the duration of toll calls, and intrastate, interstate, and international toll calls. Access to and use of the local telephone system does tend to be inelastic, with Taylor (1983) suggesting that a "best-guess" from the empirical literature on telephone demand is that the price elasticity of demand is -.1 for access and -.2 for use. Toll calls tend to be much less inelastic, however, with Taylor's (1983) "best-guess" point estimate of the price elasticity ranging from -.65 to -.9. These estimates suggest a sizable distortion due to the portion of the tax on toll telephone services.

Communications services are also important inputs into businesses' production processes, and the distorting effect of the tax on business purchases must also be evaluated. Economic theory indicates that the demand

for an input such as communications services depends on the price of the good being produced, the price of the input, and the price of other inputs used in the production process. The price elasticity of demand for an input depends on the price elasticity of demand for the final product, the proportion of total cost accounted for by the input, and the degree of substitutability of other inputs. Production functions that include telephone service as an input into production have not been estimated, so little can be said about the empirical magnitude of the elasticity of substitution between telephone service and other inputs. However, theoretical considerations alone suggest that the effect of communications excise tax varies across industries, with those firms with high usage of telephone service and those with an elastic demand for their products bearing the brunt of the tax.

The second efficiency argument for imposing an excise tax is that a product or service exhibits a negative externality. However, telecommunications is often said to exhibit positive "access" and "use" externalities.[11] The access externality arises because a new subscriber benefits not only himself, but also existing subscribers as the number of telephones that can be reached is increased. The use externality arises because a completed call necessarily affects the receiving party as well as the caller. The empirical literature has generally ignored these externalities. Taylor (1980) notes that indirect evidence is inconclusive on the importance of these externalities. Whatever their importance, however, the appropriate policy when a positive externality is present is to grant a subsidy (i.e., a negative tax). Hence, the telephone tax is precisely the wrong policy in this respect, since it leads to less, not greater, efficiency.

The communications excise tax does not satisfy either of the remaining two efficiency arguments for an excise tax. The tax is not a "user fee" for any service provided by government, nor is it a tax designed to discourage consumption of a demerit good.

B. Equity

As noted above, excise taxes generally violate the horizontal equity standard. The communications excise tax is no exception; purchases of telephone services vary widely within income classes. These variations reflect differences in local services used and fee structures (which are state-regulated), as well as differences in the use of long-distance telephone services. Given the source of those variations, it appears unlikely that an effective means could be found to mitigate the horizontal inequities exhibited by the current communications excise tax.

With respect to vertical equity, the communications excise tax is generally considered to be regressive. A recent study by the Congressional Budget Office (CBO) (1987) finds the telephone tax to be slightly more regressive than gasoline or alcohol taxes. However, when the communications excise tax

is measured against current consumption (a proxy for lifetime income), the tax is found to be only mildly regressive. Further, the CBO analysis did not take into account any possible offset of the tax, especially in lower-income classes, through increases in transfer payments. Finally, as noted above, the incidence of any particular tax is of much less importance than the incidence of the combined tax-transfer systems as a whole, and the small amount of revenue currently raised by the communications excise tax (less than half of one percent of Federal tax revenues) means it can have little effect on the overall distribution of after-tax income.

Further insight into the incidence of the telephone tax can be obtained by observing the income elasticity of demand.[12] Although not a precise measure, a tax tends to be regressive if the income elasticity is less than one and progressive if the income elasticity is greater than one. Using Taylor's (1983) best-guess of the income elasticities as a guide, local calls tend to be regressive in nature and toll calls progressive. Since the taxation of local calls is regressive, the restructuring of local and long distance rates is likely to make the telephone tax more regressive over time.

C. Simplicity

As this report makes clear, the telephone tax is not entirely simple due to the various exemptions and definitional problems, and any attempt to tax private communication services could further complicate the tax. Nevertheless, the tax is familiar, and there appears to be no great administrative or compliance difficulties with the tax.

D. Conclusion

The above analysis indicates that, on efficiency grounds, only a weak argument can be made in favor of the communications excise tax as it applies to local calls placed by households. As it applies to toll calls by households and to businesses' use of communications services, the tax causes distortions. Further, the tax is precisely the wrong policy with respect to externalities, in that telephone services exhibit positive externalities and should therefore not be taxed but rather be subsidized. There being no other efficiency arguments for the tax, on balance it must be judged as inferior from an efficiency standpoint relative to other taxes which could be used to raise the same amount of revenue.

The tax violates the horizontal equity standard. With respect to vertical equity, the tax is regressive, although perhaps only mildly so. Finally, the tax does appear to be reasonably simple, although no more so than other excises.

On balance, there are no strong arguments in favor of the communications excise tax. In addition, there are reasonably strong efficiency and moderate

equity arguments against the tax. Further, although reasonably simple in itself, the tax contributes to the complexity of the tax system as a whole. For these reasons, the tax should be allowed to expire at the end of 1987 as scheduled under current law and as envisioned in the President's FY 1988 Budget.

4. EXEMPTION FOR PRIVATE COMMUNICATION SERVICE

I. THE PROBLEM AND PRESENT SOLUTION

Private communication service, which is essentially communication service within a firm, presents problems with respect to the development and implementation of the communications excise tax. One problem is stated clearly in the legislative history:[13]

> Under present law, a private communications system such as a private line or a private intercommunication system set up for a single subscriber (such as a PBX system or Centrex service) is taxed as a part of general telephone service if the telephones in this system have access to the local exchange system.
>
> This has presented problems under present law because of competition from untaxed private equipment performing similar services. The telephone companies presently are losing intrapremise business (and interpremise business within local areas) to those providing telephone and microwave equipment which can be purchased and operated by the users themselves. Installation of equipment in this manner is accompanied by a reduction in the service from the local telephone company. Businesses installing their own internal communications systems in this manner avoid the tax on the telephone company's charge for both equipment and services. With the ever-increasing number of varied services which modern science makes it possible for telephone companies to provide, the tax on private communications systems represents a severe competitive handicap to the expanded use of these new and varied services.

A solution to the problem of the unequal tax treatment of purchasing (exempt) and leasing (taxed) was provided in 1965 with the exemption for private communication service. If the definition of private communication service includes the systems suggested in the legislative history, the exemption equalizes the tax treatment of such services, whether leased or purchased.

The legislative history is correct in suggesting that a distortion arises if a service is taxed when leased but not taxed when bought outright and

installed. To see this, recall that communication service is an input in the production of a firm's final product and consider a firm's demand for communication service. A firm's demand for an input (that is, how much of an input the firm will buy at a given input price) depends on several factors: the price of the final product of the firm, the price of the input, and the prices of other inputs used in the production process. The higher the price of the firm's final product, the more communication service the firm will buy at a given price for such service. Conversely, the higher the price of communication service, the less of such service the firm will buy. Finally, the higher the price of inputs that are substitutes for communication service and the lower the price of inputs that are complementary to communication service, the more communication service a firm will buy.

An ideal tax would not alter a firm's input or financing decisions. However, as discussed in Chapter 3, the tax on communications services changes the price of communications services relative to other inputs, and consequently does alter the firm's choice of inputs. The distortion created by the differential tax treatment of leasing and owning a particular input (e.g. communications equipment) can be understood in a similar way because leased equipment and owned equipment are highly substitutable in the production process. The relative price of these inputs is altered by the tax, and consequently the firm's input and financing decisions are changed because of the tax.

The exemption for private communication service corrects for the leasing versus owning distortion created by the tax, and also lessens distortion between private communication and other inputs. The exemption, however, introduces a third type of distortion, that between the exempt private communication service and other nonprivate communication service. That is, the exemption alters the relative price of private to nonprivate communication service, and consequently the firm's choice between these types of services is altered because of the exemption. To the extent that private and nonprivate communication services are substitutes in the production process, a cost-minimizing firm will use too much private communication service and too little nonprivate communication service, as measured by true resource cost. To minimize this type of distortion, the exemption ought to be broad enough to include all close substitutes of private communication service. But if private and nonprivate communication service are close substitutes, the implication is that the exemption should include all communication service; that is, the tax should be allowed to expire.

To summarize, the "problem" is broader than the differential taxation of leasing and owning that is recognized in the legislative history. Three distortions arise that are of concern. First, the communications excise tax distorts a firm's decision concerning how much communication service to use relative to other inputs. Second, the taxation of leased but not purchased private communication service would distort the firm's decision between

leasing and buying. Third, the current solution to the leasing versus buying problem, exempting private communication service, distorts the firm's choice between private and nonprivate communication service.

II. POLICY OPTIONS

Four alternatives to the current policy of exempting private communication service are examined below. The first, and recommended, policy option is to allow the communications excise tax to expire. The remaining three are relevant if the tax is extended. These alternatives are to return to previous law, to tax all communications services and equipment, and to improve current law by redefining "private communication service."

A. Allow the Communications Excise Tax to Expire

Under current law, the communications excise tax is scheduled to expire at the end of 1987. The President's FY 1988 Budget does not envision an extension of the tax. Expiration of the tax as scheduled would obviate the need to address the issues surrounding the exemption for private communication service. And for the reasons given in Chapter 3, allowing the tax to expire would be desirable on general tax policy grounds. For these reasons, this is the recommended policy option.

B. Return to Previous Law

The present solution (exemption of private communication service) is designed to eliminate the distortion between leasing and purchasing equipment, but creates another distortion between private and nonprivate communication service. If private communication service were taxed as under previous law, the distortion between private and nonprivate service would be eliminated, but the distortion between leasing and purchasing, as well as between private communication services and other inputs would remain. The better situation depends, in part, on the substitutability of leasing and owning relative to that of private and nonprivate service.

The empirical evidence on business demand for telephone service is scant. The few studies that have examined business demand at all have divided demand into three components: WATS (wide area telephone service), private line, and MTS (measured telephone service). Private line service is a subset of what the law refers to as private communication service, while WATS and MTS are not. Taylor (1983) notes that "there is solid evidence in the Feldman study (1976) that WATS, private line, and MTS are strong substitutes." Therefore, the exemption of private line from the communications excise tax presumably distorts the communication input decision of firms toward private line and away from WATS and MTS. However, citing evidence by Subissati (1973), Taylor

(1983) goes on to suggest that "WATS, private line, and MTS may actually be complements in the long run, but substitutes in the short run." Clearly, the economics profession has not yet reached a definitive answer on the degree of substitution between WATS, MTS, and private line.

There is no hard evidence on the substitutability of leased versus purchased equipment. However, one would expect a high degree of substitutability between these two inputs since it is only the financing mechanism that differs. Consequently, the distortion that would arise from the unequal treatment of leasing and owning may be significant. Furthermore, a firm could avoid the tax under previous law by bypassing the local or long-distance exchange through purchase of microwave equipment, satellites, and other bypass technologies.[14] A recent report by the U.S. General Accounting Office (1986) offers some insight into the popularity and substitutability of various bypass technologies. The report found that 16 to 29 percent of large-volume customers are bypassing the local telephone companies. The most popular types of bypass are microwave, cable/wire, and fiber optics. Survey evidence indicates that bypass technologies substitute for dedicated (or private) line service. A return to previous law would lead to further use of purchased bypass equipment.

In summary, current evidence does not warrant a return to previous law (assuming the tax is extended) on the grounds that the distortion created by the exemption is more harmful than the eliminated distortion. Leasing is probably a far closer substitute to purchasing than private line is to MTS and WATS, and therefore the change would cause even more equipment to be purchased rather than leased.

C. Tax All Communication Services and Equipment

A second policy option, if the tax is extended, is to maintain neutrality in the leasing versus purchasing decision by taxing the services derived from all communication equipment, regardless of whether the equipment is leased or purchased. The exemption for private communication services would be repealed. This alternative has the advantage of not creating a distortion between private and nonprivate communication service. It also has the advantage of possibly removing other existing distortions between leased and purchased equipment used in communications aside from "private communication service," such as leased versus purchased telephone instruments (since the latter are currently not subject to tax).[15] It has the disadvantage, however, of increasing the distortion between the purchase of communications services and the purchase of all other inputs. And it could lead to distortions between various types of equipment.

Maintaining neutrality between the tax on services provided by leased and purchased equipment requires that purchased equipment be taxed at a rate equivalent to the tax on lease payments for leased equipment. Theoretically,

this could be done by setting the tax on purchased equipment equal to the present value of future tax liabilities from leasing. If the tax rate remains constant over time, this equality is easily achieved, since the price of purchased equipment should be equal to the present value of lease payments for the same equipment. Thus, a tax on the purchase price will just be equal to the present value of future tax liabilities, computed at the same tax rate, on lease payments.[16]

While this option may be straightforward in theory, in practice it poses a number of difficulties. There is no straightforward definition for the equipment that should be subject to tax. There are also a number of circumstances under which the tax would cause differentials between various types of equipment.

1. Definitional Problems

A definition would need to be provided for the equipment subject to tax. If the definition were limited to equipment actually used in providing local telephone, toll telephone, and teletypewriter service, the tax would be extremely difficult to administer and would create new distortions. It would be very difficult to verify the actual use of any piece of equipment, or to administer any set of rebates or impositions of tax on used equipment as it was switched from taxable to nontaxable, or nontaxable to taxable use. For example, a telephone instrument (leased or purchased) used in a PBX system that did not have access to the local telephone exchange would not be subject to tax under this definition, but would become subject to tax if the PBX obtained access to the local telephone exchange. (This assumes the tax would apply to used equipment; if it did not, the tax could easily be avoided. However, a rebate or other mechanism would be required to ensure that the same piece of equipment was not subject to tax more than once.) Further, this definition would create new distortions between services which are currently nontaxable by virtue of being private communication services, and other services which are currently nontaxable because they fall outside the scope of the communications excise tax (see the discussion in Section D, below).

A broader definition would extend to all equipment which could be used in providing currently taxed services. While this definition would avoid some of the administrative and distortionary problems caused by the narrower definition, it raises its own set of problems. This definition would extend the tax base well beyond its current boundaries, and it would be difficult to set the new boundaries. For example, would (should?) this definition sweep in all LANs, computer modems, and computers used to operate electronic mail and similar "communications" software? Could the boundaries be set so that all close substitutes to taxed equipment were also taxed, but no other equipment was taxed? These and other difficult technical issues would have to be resolved in order to properly implement this broader definition.

2. Tax Differentials

This option would also require attention to a number of circumstances under which the tax would cause differentials between various types of equipment irrespective of how broadly equipment was defined. The first problem would arise with equipment that was leased (or otherwise used to provide communications services subject to tax). To avoid a double tax, either such equipment would have to be exempt and the lease payments taxed, or the equipment would have to be taxed and the lease payments exempt. The former approach would be preferable, since it would tax all services associated with leased equipment, while the latter approach would not tax ancillary services provided by a communication company (e.g., maintenance), or would require ancillary services to be separately valued from pure equipment lease charges. However, the tax under the former approach could be avoided if the equipment was resold.

Thus, a tax on sales of used equipment is also necessary. This would cause an administrative problem, because it would be difficult to enforce the tax on relatively small sales of equipment. In general, the rule should be that sales of used equipment should be subject to tax unless the equipment was taxed when originally purchased, in which case the sale would be exempt. Note that this rule would do little to eliminate the windfall gains that current owners of equipment would receive if the tax were extended to equipment. The windfall would arise because purchasers of new equipment would have to pay the tax, and increase the price of their output accordingly, thus raising the return on existing equipment. Only in those instances where the existing equipment was sold, subject to tax, would the windfall be eliminated.

A third problem is that, if the tax rate changes over time, the tax rate that applies at the time of purchase would no longer yield the present value of future tax liabilities on lease payments. The calculation of the present value of tax liabilities would be difficult for a single product if the tax rate changes over time, and the difficulties would be compounded by the many technologies for which the tax would have to be calculated. If this option were adopted at a time when the tax rate is expected to change in the future, either the tax would become very complex administratively, or it would create a large number of distortions and windfall gains and losses.

A fourth problem is that the tax on purchased equipment would apply to ancillary services (such as maintenance) provided by a communication company, whereas the same services provided by a business for itself would not be taxed. A possible solution, albeit quite imperfect, would be to have a differentially higher rate of tax on purchased equipment.

A fifth problem lies in the handling of a wholly or partially self-constructed piece of communication equipment. This problem includes the proper valuation of such equipment, the technical and administrative difficulty of determining the base of the tax, and the time it should apply. In addition, any company that self-constructs taxed equipment would of necessity have to remit

the tax, thus greatly increasing the number of potential payors of communications excise tax.

A final problem is choosing the stage in the manufacture and distribution of equipment at which the tax is to be applied. To minimize the number of taxpayers, the tax on equipment should be structured as a manufacturer's excise, so that only manufacturers (possibly including self-constructors) and importers would have to pay the tax. The difficulty with this approach, however, is that the effective rate of the tax would vary depending on the value of transportation, wholesale, and retail services used between the manufacturing stage and the sale to the final purchaser. Thus, for example, a large-volume equipment user that was located near, and dealt directly with, the manufacturer would pay an effective rate of tax close to the statutory rate, whereas a small purchaser buying at retail would have a much lower effective rate. These differentials may be both inefficient and inequitable. However, to avoid them by placing the tax at the point of final sale would vastly increase the number of taxpayers, and therefore the administrative and compliance costs of the tax.

D. Redefine "Private Communication Service"

A third policy option, assuming the tax is extended, is to retain the current law exemption. If this policy option is chosen, the statutory definition of private communication service should be improved. The problem with the current definition is that all products that are close substitutes in production ought to be, but are not currently, included in the definition. That is, the exemption should be designed so as not to discriminate between different types of services that are substitutes for the statutory definition of private communication service in a firm's production decision.

The taxation of intra-firm communication services depends to a large extent on the particular circumstances involved, as Revenue Ruling 79-405, 1979-2 CB 383 illustrates. In Revenue Ruling 79-405, three services are considered, all of which involve microwave transmission. The first is called "private line, point-to-point," which is designed to provide a customer that has business locations in each of two cities with an exclusive, private communication channel between those two locations. With this service, a customer can access the local telephone system in the second location through its switchboard at that location. The second service is similar to the first service except that its customers share facilities on a first-come, first-served basis and are never connected to a switchboard. The third service allows the customer access to any city served by the firm and, unlike the first two services, gives the customer direct access to the local telephone network in the origination and termination cities.

The Revenue Ruling concludes that the first service is exempt because of the private communication exemption. The second is ruled to be exempt because

it does not fall within the definition of toll telephone service and not because of the private communication exemption. The third is ruled to be taxable as a toll telephone service.

While it is beyond the scope of this report to determine which services are close enough substitutes that their exclusion from the definition of private communication service would cause serious economic distortions, the above example suggests that the statutory definition may not be broad enough to include close substitutes. Thus, there would seem to be some room for improvement in the definition of private communication service for efficiency reasons.

III. SUMMARY

The current exemption for private communication service is an attempt to neutralize the otherwise disparate tax treatment of owning rather than leasing communication equipment. An unintended consequence of this exemption is that it creates a distortion between private and nonprivate communication service. The recommended policy option is to allow the communications excise tax to expire as scheduled under current law and as envisioned in the President's FY 1988 Budget. This option would not only obviate the need to address the problems associated with the current exemption, it would also be desirable on general tax policy grounds.

If the tax is extended, one policy option is to return to previous law. Previous law, though distorting the owning versus leasing decision, did not distort a firm's decision between private and nonprivate communication service. However, it does not appear that the new distortion is greater than the previous distortion. Furthermore, a return to previous law would exacerbate the problem of bypass.

A second policy option, if the tax is extended, is to tax the services provided by communication equipment, regardless of whether the equipment is leased or purchased. This would eliminate the distortion between private and nonprivate communication service, but would exacerbate the distortion between communication services and other inputs. Further, it would be difficult in practice to define the equipment that should be subject to tax, and there are a number of circumstances under which the tax would cause differentials between various types of equipment.

A third policy option, if the tax is extended, is to improve current law. This could be accomplished by rewording the definition of private communication service to attempt to include all close substitutes.

5. SPECIFIC EXEMPTIONS

I. INTRODUCTION

Specific exemptions from the communications excise tax are contained in section 4253 of the Code. These are for coin-operated service for local calls and for toll calls costing less than 25 cents, except that amounts paid for guarantees for coin-operated service are taxable; installation (but not maintenance) charges; items otherwise taxed; services used by common carriers (those engaged in transportation of persons or goods) and communications companies (this exemption applies to toll telephone service billed at a flat rate or on total transmission time, i.e., WATS service); news services (except local telephone service) in the conduct of the news function; international organizations and the American National Red Cross; state and local governments; nonprofit hospitals and educational organizations; and toll calls originating from servicemen in a combat zone. In the discussion below, these exemptions are grouped into two categories: those supportable for economic reasons, and others (some of which may be supportable for noneconomic reasons).

II. EXEMPTIONS SUPPORTABLE FOR ECONOMIC REASONS

The exemption for certain coin-operated service can be justified on both equity and efficiency grounds. Although few studies examine coin-operated service explicitly, Taylor (1980) notes that evidence contained in a study by Feldman (1976) suggests a price elasticity of about -.8 with respect to the number of pay telephone calls. While still inelastic, this price elasticity is much less inelastic than for all telephone service, which suggests that the efficiency loss from taxing coin-operated service is high relative to other telephone service. With respect to the average length of conversation in a station-to-station call, Feldman finds a much smaller price elasticity and an income elasticity of .03. This low-income elasticity suggests that a tax on coin operated service would be regressive.

The exemption of items otherwise taxed and, in some circumstances, the exemption for communications companies can be justified because of differential tax rates that would otherwise result. If inputs that are purchased by firms at different stages of production are themselves produced using

telephone services, the inputs already have the communications excise tax built into their price. An additional tax on an item already taxed would lead to differential tax rates, with products that use a large proportion of heavily taxed inputs having a higher effective tax rate. Similarly, given that the final product of communication companies is generally subject to the communications excise tax, the same tax applied to communication companies would lead to a pyramiding effect. Note, however, that the exemption from tax on WATS service used by common carriers and, in some instances, by communication companies (such as radio stations), cannot be justified by this rationale.

The exemption for installation charges can be justified for both equity and efficiency reasons. Since installation costs the same whether one is rich or poor and is required for use of the telephone system, a tax on installation charges would require a poor person to pay a greater percentage of his income in tax than a rich person; that is, the tax would be regressive. In addition, a tax on installation charges would create a tax-induced bias toward self-installation.

III. OTHER EXEMPTIONS

Nonprofit organizations are given a variety of subsidies at all levels of government, including exemptions from federal and state corporate income taxes and local property taxes. These exemptions are granted to encourage the activities undertaken by nonprofits. Tax exemptions granted to nonprofits, including the exemption of nonprofit hospitals and educational organizations from the communications excise tax, might best be considered in the context of a broad national policy toward the nonprofit sector. However, it should be noted that where tax exemption carries over to business services of nonprofits, it may encourage them to produce commercial-type goods in competition with for-profit firms.

The tax treatment of state and local governments is also a much broader policy question. The United States has a history of exempting one level of government from some, but not all, taxes imposed by another level. The Administration also has recently advocated including state and local governments in the gasoline tax on the grounds that the gasoline tax is a user fee. Since the communications excise tax is not a user fee, this does not imply that state and local governments should be subject to the tax. Moreover, the Federal government is exempt from the communications excise tax by virtue of section 4293 of the Code, and foreign countries are also exempt. Thus, the exemption for state and local governments is consistent with the treatment of the Federal level of government and with historical precedent.

The exemption for international organizations can be justified in the broader context of encouraging exchange between different cultures or on sovereignty grounds. The broader exchange question should again be dealt with

as part of a national social policy. The idea that an international organization should not have to answer to a foreign government is consistent with the treatment of foreign governments.

The exemption for toll calls made by servicemen in combat zones would only apply if the calls were made collect or otherwise billed in the United States. The exemption is supportable on the grounds that if the calls were not made collect they would not be subject to tax (because they would be paid outside the United States).

The rationale for the exemption of news services may be that this industry uses telecommunications more than other industries and would be overburdened by the tax. This may be legitimate, but it argues more for the elimination of the tax than the exemption of news services.

Finally, as noted above, the exemption for communication companies and common carriers is only justified to the extent that it avoids pyramiding of the communications excise tax.

The estimated revenue costs of specific exemptions, as well as the exemption for private communication service, are shown in **Table 2**.

IV. CONCLUSION

If the communications excise tax is extended, consideration could be given to deleting or modifying several of the specific exemptions to the tax. However, none of these issues would need to be addressed if the tax were simply allowed to expire at the end of 1987. Expiration of the tax, as scheduled under current law and as envisioned in the President's FY 1988 Budget, is the preferred policy option.

TABLE 2

ESTIMATED REVENUE COST OF EXEMPTIONS TO THE COMMUNICATIONS EXCISE TAX, 1986

Exemption	Revenue Cost in 1986[a] ($ Millions)
Exempt Under Section 4252	
Private Communication Service	535
Exempt Under Section 4253[b]	
Coin-operated Service	33
Installation Charges	30
Common Carriers and Communications Companies[c]	25
News Services	17
International Organizations	*
State and Local Governments	95
Nonprofit Hospitals	21
Nonprofit Educational Organizations	7
Servicemen in a Combat Zone	--

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* Less than $5 million.

[a] All revenue estimates include an income tax offset.

[b] These estimates assume the private communications exemption is repealed.

[c] Excludes telephone companies.

FOOTNOTES

[1] U.S. General Accounting Office (1986, p. 162).

[2] This information, as well as other useful comments, were graciously provided by Mary Fitzpatrick of the U.S. Department of Justice.

[3] See Brock (1982), pp. 240-242, for a further discussion of this case.

[4] U.S. General Accounting Office (1986, p. 157).

[5] Fisher and Martin (1986), p. 230.

[6] This section is based heavily on Singleton (1986), Chapter 17.

[7] This provision of the tax causes administrative problems for the IRS. If the purchaser refuses to pay the tax, the burden of collection falls on the IRS rather than the seller. Since the tax potentially collected through pursuit of a purchaser who refuses to pay is usually very small, it is not cost-effective for the IRS to pursue such individuals.

[8] The elasticity between two variables, X and Y, is defined as

$$\frac{\text{percentage change in X}}{\text{percentage change in Y}}.$$

Accordingly, the price elasticity of demand for a product is defined as

$$\frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}.$$

A good is said to be "price elastic" if a one-percent increase in price leads to a greater than one-percent decrease in quantity demanded; that is, if the price elasticity is greater than one (in absolute value). A good is said to be "price inelastic" if a one-percent increase in price leads to a less than one-percent decrease in quantity demanded; that is, if the price elasticity is less than one (in absolute value).

[9] See, for example, the recent study by the Congressional Budget Office.

[10] Lifetime incidence estimates can be found in Davies, St-Hilaire, and Whalley (1984). They find that sales and excise taxes become less regressive when lifetime rather than annual income is used. Further, lifetime incidence estimates are less responsive to alternative incidence assumptions.

[11] See Taylor (1980), Chapter 2, and the references cited therein.

[12] Following the discussion in footnote 8, the income elasticity of demand is defined as

$$\frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}.$$

[13] Staff of the House Ways and Means Committee, 89th Congress, 1st Session, Legislative History of H.R. 8371 (The Excise Tax Reduction Act of 1965) pp. 30-31 (Committee Print 1965). Identical language is found in the Report of the Senate Finance Committee (pg. 36).

[14] Legette (1986) and Brock (1984) discuss some of the issues involved in bypass.

[15] An alternative way to correct for the current distortion between leased and purchased equipment is to exempt all leased equipment. However, this method would probably lead, over time, to a serious erosion of the tax base, since much of currently taxed telephone services could be transformed into leases of equipment.

[16] To see this, suppose that a piece of equipment that lasts for T years is leased for $P a

year for each of its T years of life. The present value of lease payments, assuming an interest rate of i, is

$$PV = \sum_{n=1}^{T} P_n/(1+i)^n$$

The purchase price must be equal to PV; if the purchase price were lower everyone would buy and if it were higher everyone would lease. Multiplying both sides of the above equation by t shows that a tax at rate t on the purchase price is just equal to the present value of the future tax liability on lease payments.

This study was prepared by Timothy J. Goodspeed of the Office of Tax Analysis' Individual Tax Staff, under the direction of James R. Nunns. Secretarial assistance was provided by Carolyn B. Greene.

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